

Designing for Impact IV: **Workshop on Building the National Network for Manufacturing Innovation**



ADVANCED MANUFACTURING NATIONAL PROGRAM OFFICE

Dialogue 4 Backgrounder: **Summary of Input Offered at Prior *Designing for Impact* Workshops**

Education and Workforce Development

1. How could Institutes support advanced manufacturing workforce development at all educational levels?

Discussions centered around suggested best practices and assessment. Suggested activities to promote education and workforce development included:

1. Bring manufacturing to students, such as by bringing 3D printers to schools.
2. Bring students to manufacturing. Industry partners can host them, or Institutes can develop on-site fab labs.
3. Offer free online training courses (based on Khan Academy model).
4. Use video games for recruiting.
5. Educate children before 7th and 8th grade so they don't track out of pre-algebra & courses for STEM careers.
6. Gender differences need to be acknowledged and projects design accordingly. For example, design projects can be a toothbrush; not a car transmission.
7. Internships are critical for college-age students.
8. Incorporate manufacturing into the curriculum and develop materials (high schools & community colleges).
9. Change the perception of manufacturing with youth, students, and parents.
10. Fund scholarships at associate, undergraduate and graduate levels.

2. How could Institutes ensure that advanced manufacturing workforce development activities address industry needs?

The Institutes should have industry representation in the governance. As new technologies enter industries that require manufacturing, new sets of skills are required. The Institutes need to take the pulse of regional industry needs and ensure that lower skill workers are getting the training they need to enter middle skill jobs. The focus should be on unemployed, underemployed, and displaced workers, as well as returning military personnel. Master's Degree programs can be developed at regional universities to address emerging needs.

3. How could Institutes and the NNMI leverage and complement other education and workforce development programs?

The NNMI could leverage and complement other education and workforce development programs by benchmarking best practices. TechShop (a membership-based workshop that provides access to tools and instruction), Dept. of Labor workforce development programs and SME videos were identified as models.

The Institutes could each establish a library so members can easily learn about complementary education and workforce development programs, and federally funded programs such as NSF's Advanced Technology Education Program and NIST's Manufacturing Extension Partnerships. Industry partners could publish information that details the types of skills they would like to see in their current and future employees and the IMIs. IMIs could bring in high-profile speakers and develop seminars/programs that piggyback on regional events. They could also establish an Office of Workforce Development Advisory Council to ensure that industry, academia, and government labs are collaborating and supporting one another in education and workforce development. Similarly, the Institutes could partner with jobs centers to establish training pathways for displaced workers. They could also engage vocational/technical schools, skilled trade organizations, trade unions, and apprenticeship programs.

Turn to continue

4. What measures could assess Institute performance and impact on education and workforce development?

The following were suggested: take measures of employment, either from number of employers that hired new workers, numbers of student placements in industry, job performance, etc. Assessment could be performed with a five-year follow-up. A useful measure of performance and impact could be the number of courses offered by the IMIs. ABET outcomes could also be used. Participants noted the importance of publicizing the impact of the Institutes, to demonstrate their value to stakeholders and voters.

5. How might institutes integrate R&D activities and education to best prepare the current and future workforce?

Students at all levels should be involved in industry-driven R&D programs. Industry participants pointed out that they have good success using internships, co-ops, and apprenticeships as a way to prepare their workforce. Teacher/faculty externships were also proposed. The Institute could offer continuing education units and training focused on specific employer needs. They might also offer a prize or award for completing an NNMI project. It was noted that teaching hospitals are a useful model: the institutes could connect industry with educators and provide students opportunities for real-world experiences.